Glyphosate alters olfaction in juvenile coho salmon, *Oncorhynchus kisutch*

Keith B. Tierney, Peter S. Ross, Hugh E. Jarrard, Christopher J. Kennedy*
Simon Fraser University

Juvenile salmonids use olfaction to imprint to their natal stream, thus pesticides that impair olfaction at sublethal levels are of concern. The effects of the herbicide glyphosate (N-(phosphonomethyl) glycine) on salmonid olfaction were tested using electroolfactograms (EOG; nasal trans-epithelial voltage) in coho salmon parr, (*Oncorhynchus kisutch*). EOGs were measured prior to, during, and following exposure of the olfactory rosette to various concentrations glyphosate. Significant reductions in EOG responses to the behaviorally relevant odorant L-serine occurred with exposure and were correlated to both exposure time and chemical concentration. Recovery of EOG responses post-exposure were glyphosate concentration-dependent, and at 70-min post-exposure not all treatment groups recovered 100%. However, exposure of the rosette to high concentrations of glyphosate, which completely eliminated any EOG response, showed recovery to the same level as all other concentrations. This suggests that there may be several mechanisms of pesticide-mediated olfactory impairment, one transient and another more permanent. These results indicate that glyphosate is an olfactory toxicant capable of reducing EOG and potentially affecting olfactory-mediated behaviors in Pacific salmonids. Collaborations with a lab at the Canadian Department of Fisheries and Oceans are enabling ecological risk assessment through in-field pesticide monitoring.